

## ABSTRACT

System and method for analyzing and imaging three-dimensional volume data sets using a three-dimensional sampling probe. A number of sampling probes can be created, shaped, and moved interactively by the user within the whole three-dimensional volume data set. As the sampling probe changes shape, size, or location in response to user input, the image is re-drawn at a rate sufficiently fast to be perceived as real-time by the user. In this manner, the user can more easily and effectively visualize and interpret the features and physical parameters that are inherent in the three-dimensional volume data set.